

## THE 'TEXTBOOK GIBSON'

THE 'TEXTBOOK GIBSON': A CASE STUDY IN THE ASSIMILATION OF  
DISSIDENCE.

## THE 'TEXTBOOK GIBSON'

## ABSTRACT

Ever since Kuhn's work on scientific revolutions, there has been growing recognition of the conservatism of 'normal science.' The introductory textbooks, as representatives of a discipline, aim to present a consensus, and hence are themselves a powerful force for non-change. This article is a case study in how the textbooks have dealt with one of psychology's most eminent dissidents, James Gibson (1904-1979). Our review of over a hundred textbooks, dating from the 1950s to the present, reveals fundamental and systematic misrepresentations of Gibson. Although Gibson continues to figure in most of the textbooks, his work is routinely assimilated to theoretical positions he had explicitly rejected: cue theory, stimulus-response psychology, and nativism. Furthermore, his work has come to be widely represented as a *complement* to traditional psychological theory. In short, this eminent dissident has, through a largely unconscious process of assimilation, been transformed into a reassuringly mainstream figure, the "Textbook Gibson".

Key words: James Gibson, ecological psychology, textbook science, normal science

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The introductory textbook is in an obvious sense derivative, and far removed from the main sites of scientific knowledge production. Furthermore, unlike much of the ‘secondary literature,’ such as literature reviews and advanced handbooks, the general textbooks can hardly be expected to cover the relevant primary literature with any consistent depth or expertise.

Nevertheless, despite its derivative status, the psychological textbook is highly influential. It is likely to be the first contact students have with the topics covered in their courses, and for those students who do not specialize in psychology (i.e. the majority in the USA), the only psychological text they are likely to read or own. As such, the introductory textbook serves as an important representative of psychology, and not just to students, but also to the wider world.

The format of the textbook is itself highly potent. The order of the chapter headings (which has remained largely unchanged over several decades) sends implicit yet influential messages about what is supposed to be fundamental or ‘hard’ science, and what, in contrast, is ‘soft’ and tentative. The chapters on sensory and physiological psychology occur at the beginning, whereas social and ‘applied psychology’ (should *that* appear at all) come somewhere towards the end. Even the style of writing and choice of graphical representations can be highly persuasive about the conclusiveness (or otherwise) of the findings and theories being reviewed (Smith, Best, Stubbs, Bastiani & Roberson-Nay, 2002; Smith, Best, Stubbs, Johnston & Bastiani 2000; Smyth, 2001).

Clearly, given the range of different areas that the textbooks have to cover, there is an inevitable risk of superficiality and inaccuracy, a problem compounded by the habit of some textbook writers to recycle one another’s material. (Kagan, 2006, pp. 66-68, has provided an account of such plagiarism on an industrial scale.) However, there is also the temptation or perhaps obligation to disregard or downplay important divisions within the discipline. A consensus about the need for consensus seems to have been established early within psychology (see Pillsbury, 1911, p. vii.). Misrepresentation by

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the textbook writers is thus not just a reflection of superficiality or carelessness, but also motivated by a desire to convey a sense of shared disciplinary values and agendas (Brush, 1974; Costa & Shimp, 2011; Lubek, 1993; see also Blumenthal, 1991). "Shadow history" (Watson, 1993) plays an important role here, where a discipline recreates its history to conform to current ideals and concerns. Kuhn (1963), who drew a sharp contrast between creative science and routine 'normal' science, actually approved of such 'textbook' science, at least for the majority of students destined to become 'normal' scientists (Kuhn, 1962, p. 20). However, as Nersessian (2003) has demonstrated, 'textbook' science downplays the importance of tacit knowledge and creativity even in normal science. "Much of the credit for the success in creating practitioners goes to the apprenticeship ... during which practices are learned in authentic situations" (Nersessian, 2003, p. 189).

If 'textbook' science is not merely misleading about normal science, how does it deal with radical dissidence? As Kuhn (1962) famously argued, normal science is highly resistant to revolutionary change. Psychology has had its fair share of notable dissidents, such as David Bakan (1969), and Sigmund Koch (1999), but they are seldom mentioned in the textbooks. One important dissident who could not easily be ignored is B. F. Skinner,<sup>1</sup> and he has certainly been subject to "steady misrepresentation" (see Todd & Morris, 1992). Skinner's relation to mainstream psychology, however, is complicated. His immediate followers isolated themselves within their own field of behavior analysis (Krantz, 1971, 1972; Coleman & Mehlman, 1992). Furthermore, Skinner was known within and beyond psychology mainly through his popular writings, and these often contradicted the logic of his own theory (see Costall, 1996; see also Scharff, 1982). We will be concerned with a more centrally placed dissident, James Gibson (1904-1979).

## JAMES GIBSON, AN EMINENT DISSIDENT

Gibson's position in recent American psychology was almost unique. As Harry Levin, Thomas Ryan, and Ulric Neisser explained in their Memorial Statement for Cornell University, within the field of perceptual research he was "simultaneously its most eminent and most dissident member" (cited in E. J. Gibson, 2002, p. 108). Gibson

remained a prominent figure within psychology throughout his long career. His early experiments on memory for visual form (Gibson, 1929), on perceptual adaptation (Gibson, 1933, 1937a & b) and on perceived orientation (Gibson & Mowrer, 1938), were widely cited in the important publications of the time, including Koffka's *Principles of Gestalt psychology* (1935) and Tolman's *Principles of purposive behavior* (1932), and also in the handbooks of experimental psychology (Woodworth, 1938; Stevens, 1951; Osgood, 1953). His election to the prestigious Society of Experimental Psychologists, in 1939, was the first of many of the highest honours in American psychology that he received throughout the course of his long career (see E. J. Gibson, 2002; Hochberg, 1994). Gibson's writings continue to be included in compilations of classic contributions to psychological science, including the centenary editions of the *Psychological Review* and *The British Journal of Psychology* (Gibson, 1954/1994; 1958/2009; Harré, 1981; Yantis, 2000).

By the 1940s, however, when he was already a prominent figure, Gibson came to have serious doubts about the state of modern psychology. He was convinced that the traditional atomistic and artificial approaches to the study of perception were fundamentally mistaken. All of the existing theories presupposed that the available information was inherently limited or ambiguous and hence required the perceiver to enrich it, or fill in the gaps. But, as Gibson continued to maintain, the existing theories, empiricist, nativist, or rationalist, kept begging the question by invoking prior knowledge in order to explain perception:

Knowledge of the world cannot be explained by supposing that knowledge of the world already exists. All forms of cognitive processing imply cognition to account for cognition. (Gibson, 1979, p. 253).

Gibson's criticisms of perceptual theory had - and still have - much wider implications. In the 1940s and 1950s, the domain of perceptual research was extensive. Questions about the reliability of perception were closely connected with the concerns of clinical and social psychologists. In particular, the topic of social stereotyping was a pressing issue, in the light of the rise of fascism in Europe, and the purges of suspected communists closer to home. These concerns are very evident in Gibson's early writings (Gibson, 1939; 1953). His first book, *The perception of the visual world*,

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even makes reference to the Salem witch hunts (Gibson, 1950, p. 211). (Around this time, Gibson was having his own experience of 'witch hunts.'). Although, the scope of perceptual research has become much more restricted in more recent psychology, Gibson's criticism of representationalist theories of perception nevertheless came to have wider relevance once representationalism became the dominant mode of theorizing within psychology in general.

Gibson regarded the problems in perceptual theory as reflecting the wider precarious condition of psychology as a science:

Psychologists are simply, on an absolute scale, dullards. ... They seem to feel, many of them, that all we need to do is consolidate our scientific gains. Their self-confidence astonishes me. For these gains seem to me puny, and scientific psychology seems to me ill-founded. At any time the whole psychological applecart might be upset. Let them beware! (Gibson, 1967, p. 142; see also Gibson, 1985, p. 22).

In a review of Gibson's 1966 book, Edwin Boring, a leading figure in American psychology, complained about "his many rude iconoclasm" (Boring, 1967, p. 154). Nevertheless, far from rejecting Gibson's work, Boring came to the following glowing conclusion:

Certainly, Gibson's volume is the most original work we have had in the field of sense-perception for a long, long time. ... the details invite dissent, and the progress of civilization depends, of course, on the interaction of dissents. (Boring, 1967, p. 154.)

Historically, Gibson's status within psychology was indeed unique. On the one hand, Gibson "'defied the crowd' more profoundly than any other psychologist of his generation" (Neisser, 2002, p. 164). On the other hand, despite defying the crowd, he, like Neisser, somehow remained a dissident *insider*.

## GIBSON AND THE TEXTBOOKS

Over the years, we have been pointing out to one another the strange – sometimes, very strange – things that the textbook writers have had to say about Gibson. For

some time, we regarded these misrepresentations as isolated aberrations, but eventually came to notice a more consistent pattern. From that point on, we have carefully examined every textbook we could obtain (118 in total, including successive editions; for a full list of references, see Supplementary Materials).

The simplest way, of course, for the textbook writers to deal with dissident figures would be simply to ignore them. In the case of Gibson, this has seldom happened: 94% of the textbooks we have inspected refer to his work.<sup>i</sup>

Another option would be to acknowledge his existence, but then immediately dismiss him, as has sometimes been the case in the more specialized literature:

[Gibson] did for perception what Skinner did for animal learning: he handicapped a generation of workers by his blinkered and oversimplified approach. (Sutherland, 1989, p. 175)

Outright dismissals of this kind are exceedingly rare in the introductory textbooks (but see Styles, 2005, p. 67). Gibson is consistently presented as offering an important alternative theoretical perspective, if one with a limited domain of validity. There are, however, two big problems. The first is the attribution to Gibson of theoretical positions that he himself emphatically rejected. The second is that the textbooks, almost without exception, fail to explain what was really distinctive about Gibson's alternative approach and, indeed, the *reasons* why he thought such an alternative was essential.

ASSIMILATING GIBSON TO THE MAINSTREAM

The textbook writers have had great difficulty making sense of Gibson's alternative approach, and occasionally come up with their own very strange solutions. For example, in their account of Gibson's explanation of shape constancy, Philipchalk and McConnell (1994, p. 105) claim that Gibson thought that the eye itself corrected *optically* for perspectival foreshortening. Carlson, Martin and Buskist (2004, p. 189), in their discussion of Gibson's theory of affordances, argue that "some affordances may not be able to afford" (a curious proposal they unfortunately credit to Costall, 1995). The following account of Gibson must surely be the most unhelpful summary for students unfamiliar with his life's work:

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Gibson suggested that human beings can *not* be directly aware of their physical worlds. ... The actual sensory inputs are often far too degraded to be able to specify external scenes and objects ... (Taylor, 1999, pp. 588-589; emphasis added).

Our concern is not with such idiosyncratic readings of Gibson, but with the remarkably consistent way that most of the textbook writers have tried to make their own sense of Gibson by assimilating his work to traditional theoretical schemes he had worked so hard to undermine.

Before we go into detail, we will first note some general features of how the textbooks deal with Gibson. Very few of the textbooks in their treatment of Gibson's approach to perception include references beyond Gibson's own books, either supportive or critical. He is usually treated as an essentially isolated figure. Furthermore, there are hardly even any quotations from Gibson's own writings to support the claims made on his behalf. Our concern, however, is with another consistent feature of the 'Textbook Gibson', the striking similarities among different authors in *how* they mispresent Gibson.

## GIBSON, THE 'CUE THEORIST'

Throughout his work, Gibson was challenging the long established assumption that perception is inevitably based upon unreliable "perceptual cues" which are only *probabilistically* related to the world. In his early work, Gibson proposed that there exist "higher-order variables" on the retina that are structured by the various surfaces in the world, especially the *ground* surface, in such a way that these variables *specify* properties of the world in a consistent and lawful way. According to Gibson, one of the basic problems with "cue theories" was that, even though they are very effective at explaining how perceivers make mistakes, they provide no coherent account of perceptual *success*, such as a pilot smoothly landing an airplane. Cue theory assumes that the information available is always inherently impoverished, so that perceivers must resort to inferences in order to 'go beyond' the available information. But, as Gibson argued, cue theory fails to explain the *source* of the additional



information that is supposed to support these inferences, since the *past* experience of the individual - or the species - is, by the very terms of the theory, as precarious as *present* experience.

As an alternative to cue theory, Gibson developed his so-called “Perceptual Psychophysics”, an explicit attempt to reinstate stimulus-response theory, by redefining both the stimulus and response in a relational, non-atomistic way (see Hochberg, 1957).

The textbook writers were quick to catch up with the appearance of Gibson’s first book, *The perception of the visual world* (Gibson, 1950), and their comments were generally positive, and well informed (Hilgard, 1953, p. 310; Hebb, 1958, p. 199; Krech & Crutchfield, 1958, p. 154). Krech and Crutchfield also rightly emphasize that Gibson’s “higher-order variables” of stimulation, such as texture gradients, constitute an “adequate stimulus”, in contrast to the unreliable cues of traditional theory, (Krech & Crutchfield, 1958, pp. 153-154).

Hebb’s 1958 textbook is one of the clearest in explaining the role of textured surfaces, including the ground, in structuring the light available to perceivers. However, although Hebb includes relevant figures from Gibson’s first book, he gives no indication that this emphasis upon surface texture was initiated by Gibson himself, or that Gibson was trying to provide a serious alternative to *cue theory*. In fact, Hebb’s textbook is one of the first to assimilate Gibson’s “higher-order variables” to traditional cue theory.

In fact, except when one is dealing with objects flying or floating in the air, all one’s judgments concern objects that are connected with (supported by) extended surfaces such as the ground, walls of buildings, ceilings, and so on; and these background surfaces have a most important influence on depth perception. As they extend away from us, they show as gradients of *visual texture*, the units into which the surface is divided .. and the irregularities within the units ... . These provide *cues* to the direction of slope of the surface, with respect to the line of vision, and thus provide cues to the size and distance of objects close to or touching the surfaces (Fig, 68). (Hebb, 1958, pp. 194-195; emphasis added)

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The textbook writers love lists, and one of the perennial lists - along with Piaget's developmental stages - concerns the various "cues" to depth perception. Many textbooks, even those that include no explicit account of Gibson's theory (e.g. Kimble & Garnezy, 1963; Levine, 2000), incorporate his proposed texture gradients and gradients of retinal flow to their list of cues. Since the 1960s, the general line taken in the textbooks, either explicitly or implicitly, is that Gibson was a cue theorist:

Gibson (1950, 1966) has done more than anyone else to emphasize the importance of the physical *cues* in perceptual phenomena ... (Lindsay & Norman, 1977, pp. 52-53; emphasis added)

Why is depth perception so easy? Clearly, a rich array of **depth cues**<sup>ii</sup> is available to one or to both eyes - especially when we're moving about (Gibson, 1979). But how do we know how to interpret these **cues**? (Kassin, 2004, p. 114; see also Davey, 2004, p. 188)

Furthermore, as the following examples illustrate, even when the textbooks attempt to explain how Gibson's approach differs from the standard accounts based upon inferences from uncertain cues, they still go on to misrepresent him instead as a cue or inference-based theorist, albeit a non-standard one:

The great nineteenth-century scientist Hermann von Helmholtz suggested that many perceptual integrations reflect unconscious inference. ... More recent investigators, notably James J. Gibson (1950, 1966), have pointed out that a total stimulus pattern at any time usually contains enough information to make these inferences or unconscious calculations. (Mussen & Rosenzweig, 1973, p. 577).

... Gibson explained depth perception in terms of *cues*, such as texture gradient and motion parallax, picked up from optic flow. ... Whereas direct perception theorists believe that these cues are picked up directly from the visual array, constructivists would suggest that they are learned through past experience with objects around us. (Cardwell, Clark & Meldrum, 2004 p. 232; emphasis added)

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The following textbook manages to present Gibson as a cue theorist and yet also offering a distinct alternative:

So far we have described the *cues* that allow the perceptual system to *infer* depth. The fact that we are not aware of these inferences has led to the idea, which can be traced back at least as far as Helmholtz before 1900, that *these inferences are unconscious*. *Consistent with this view [sic]*, Gibson (e.g. 1950, 1986) claimed that people *do not infer depth*, but rather perceive it directly. His idea is that ... perception involves a direct sensitivity to higher-order invariants. (Medin, Ross, & Markman, 2001, p. 90; emphases added)

The attempt by Gleitman (1991) to assimilate Gibson to existing approaches lurches over several pages. He first identifies Gibson as a standard cue theorist (pp. 202-203). Later, however, he characterizes him as a nativist for rejecting *cues* in favour of “*higher-order patterns of stimulation* to which the organism is *innately sensitive*” (p. 231; emphasis added). Finally, Gleitman concedes that the situation is even more complicated since Gibson’s position “is not necessarily tied up with ... the nature-nurture issue” (p. 231-232)!

In short, there is a wide consensus among the textbooks (40%) that Gibson must have been a cue theorist, and this includes the most recent textbooks. Even textbooks presenting relatively sound accounts of Gibson’s concept of direct perception, nevertheless retain the language of cues: “According to Gibson we often observe depth cues” (Sternberg, & Mio, 2009, p. 101). It is important to note that the different misrepresentations of Gibson to be found in the textbooks are not mutually exclusive. For example, the claim that Gibson emphasized “bottom-up perceptual cues” (Bernstein, Penner, Clarke-Stewart, & Roy, 2008, p. 187) misrepresents him on two counts, not only as a cue theorist but, as we will now explain, also as a bottom-up theorist.

GIBSON, THE STIMULUS-RESPONSE OR BOTTOM-UP THEORIST

Gibson’s early theory was a resolute attempt to develop a stimulus-response account of perceiving without the need to invoke intervening processes of inference, computation, construction, or representation. However, by the time of his second book, *The senses considered as perceptual systems*, Gibson (1966) had come to regard stimulus-response

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3 thinking within psychology as fundamentally misguided. As he had already pointed out in his  
4 first book, much of the variation in perceptual stimulation comes about because of our own  
5 movements. We hardly ever remain still:  
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9 The normal human being, however, is *active*. ... If he is not walking or driving a  
10 car or looking from a train or airplane, his ordinary adjustments of posture will  
11 produce some change in the position of his eyes in space. Such changes will  
12 modify the retinal images in a quite specific way. (Gibson, 1950, p. 117;  
13 emphasis added)  
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19 Gibson's work on active touch (Gibson, 1962) nicely exemplifies his emphasis upon  
20 the primacy of activity in perceiving in general: "The active senses ... are analogous  
21 to tentacles and feelers" (Gibson, 1966, p. 5). Gibson could not have been more clear  
22 about his rejection of S-R theory: "percepts are not responses to stimuli" (Gibson,  
23 1975/1982, p. 411).  
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28 In his second book, Gibson (1966) redefined all of the senses functionally rather than  
29 anatomically, as *active* interrelated organs of exploration, supported by a basic orienting  
30 system. The perceptual systems, so defined, do not "receive" but "obtain" information.  
31 Global optic flow, for example, is not a "stimulus", since it is brought about through our  
32 moving around in the world. Gibson's rejection of stimulus-response thinking was thus a  
33 fundamental departure not only from existing approaches to perception, but from the dualism  
34 within much of psychological theory more generally, based, as it is, on a dualism of an active  
35 mind versus a passive body (see Costall, 2006).  
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43 Several textbooks correctly explain Gibson's emphasis upon activity (e.g. Munn, Fernald, &  
44 Fernald, 1969, p. 176; Buss, 1973, p. 158; Bruce & Green, 1985, p. 197). However, the  
45 majority of the textbooks not only ignore Gibson's outright rejection of stimulus-response  
46 theory, but also present him, instead, as the foremost proponent of such an approach in its  
47 extreme, non-mediational, form. Gibson's theory is presented as essentially passive, as a  
48 pure stimulus-response theory, or else, as in the more recent textbooks, as a "bottom-up  
49 theory".  
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An influential and controversial theorist ... is James Gibson (904-1980) [*sic*], whose theory of **direct perception** truly defines the bottom-up approach. (Sternberg, 2003, p. 127)

The theories of Marr, Gibson and Selfridge are all what we call bottom-up theories of perception. In other words, they explain perception by starting with the visual stimulus and its effects on the nerve cell of the visual system and piecing it together.' (Hayes, 1998, p. 31; see also, Stillings, Weisler, Chase, Feinstein, Garfield, & Rissland, 1995, p. 464; Taylor, 1999, p. 588; Solso, 2001, p. 111; Cardwell, Clark, & Meldrum, 2004, p. 217; Davey, 2004, p. 195; c.f. Eysenck & Keane, 2000, p. 58)

The characterization of Gibson as an essentially passive theorist is not restricted to the general textbooks. Successive editions of Richard Gregory's *Eye and brain* have portrayed Gibson as a *passive* theorist. In fact, this text, which first appeared in 1966, is the most likely source of this widespread misrepresentation of Gibson's theory. The following passage comes from the fifth edition:

.... the kind of approach to vision which is developed in this book ... may be called an *indirect* and *active* account. ... The alternative - that perceptions are directly from the external world - was argued most strongly by the American psychologist James J. Gibson (1904-1979), at Cornell University. ... Gibson's essentially *passive* account is very different from the notion in this book, that perceptions are constructed hypotheses. (Gregory, 1997, p. 9)

The misrepresentation of Gibson as a bottom-up theorist in the textbooks is not only relatively extensive (23%) but is also to be found in the most recent editions (e.g. Bernstein et al., 2008, p. 187). Gibson was neither a bottom-up nor a top-down theorist. Given his emphasis upon the senses as active systems of exploration, as "feelers", he was, if anything, a bottom-*down* theorist.

GIBSON, THE NATIVIST THEORIST

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Both Eleanor and James Gibson were very dismissive of preformationist accounts of perceptual development based on the concepts of preprogramming or hard-wiring. As Eleanor Gibson put it, clearly the infant “must be equipped by nature with systems that make detection of the information possible, but to call such structures rules or logic or computing mechanisms sends one along the information processors' road of speculation, and not the road of biology” (E. J. Gibson, 1985, p. 75; see also E. J. Gibson, 1999, p. 136, on Fodor's nativism).

Both James and Eleanor Gibson rejected what they called “enrichment theories” either based upon individual experience or innate knowledge. Instead, the Gibsons were arguing that in a world rich in available information, the problem for the perceiver was not to “add” something to insufficient cues, but rather to learn to differentiate between available informative structures (J.J. Gibson & E.J. Gibson, 1955, pp. 33-4).

Several of the early textbooks include some discussion of the Gibsons' emphasis upon perceptual learning. They also rightly explain that in rejecting “enrichment” theories of learning, the Gibsons were *not* thereby committed to nativism. For the Gibsons, the extent to which perception was unlearned was an open question, and “might be expected to depend on the degree of maturity of the infant at birth, which in turn depends on his species and on the kind of environment the young of his species have been confronted with during evolution” (Gibson, 1966, pp. 266-267).

However, by the 1990s, the textbook writers had reached a wide consensus that James Gibson must be a *nativist* (for exceptions see Best, 1989, pp. 102-103; Eysenck, 1993, p. 25; Gleitman, 1981, p. 248; Gleitman, 1983, pp. 159-160). As in the other cases of the misinterpretation we have discussed so far, the textbooks present no quotations from Gibson's work to support their claims, nor any arguments to justify them. The point is simply asserted.

One version of ‘Gibson, the nativist theorist’ is based on the claim that he believed that perceiving was primarily if not exclusively innate, in the sense of present at birth:

*Gibson assumed that most perceptual learning has occurred during the history of mankind, and so does not need to occur during the*

*individual's lifetime.* However, we have to learn which affordances will satisfy particular goals, and we need to learn to attend to the appropriate aspects of the visual environment. (Eysenck & Keane, 2000, p. 59; emphasis added.)

... the Gestalt psychologists believed that perception was quite automatic, requiring little learning. ... more recent theorists (e.g. Gibson, 1979) also propose that *many* aspects of perception, particularly the elements of depth perception called texture gradients, are unlearned and automatic to all humans with normally functioning visual systems. (Bell, Greene, Fisher, & Baum, 1996, pp. 70-71; emphasis added; see also Davey, 2004, p. 303)

There is also wide agreement among the textbook writers that James Gibson was indeed committed to nativism in the more specific theoretical sense that the role of experience is assumed not to be formative, but merely supportive, triggering preformed, hard-wired structures:

Gibson (1979) thought that in the real world sufficient contextual information is usually available to make perceptual judgments, including those regarding shapes. He believed that we use this contextual information directly; in essence, we are prewired to respond to it. (Sternberg, 1995, p. 170)

According to the theory of direct perception, both the understanding of depth cues [sic] and the meaning of falling off a cliff are native endowments of the human species. (Westen, 1996, p. 163.)

According to the **Gibsonian Approach**, your brain is "hard-wired" to *see the world as it is.* ... Gibson believed there is a one-to-one correspondence between sensory inputs and perceptual experiences, and that this correspondence is determined by the genes. (Philipchalk, & McConnell, 1994, p. 105; see also Simons, Irwin, & Drinnin, 1987, p. 126; (Dworetzky, 1988, p. 119; Maitland, 2010, p. 91.)

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As we have explained, Eleanor and James Gibson argued out that both the nativists and empiricists failed to explain the source of the prior knowledge that was supposed to supplement the available perceptual information. However, they had a further reason for rejecting the idea that perceiving and acting could be completely pre-programmed. Not only are our own bodies and action capacities subject to change over time, but also the situations we encounter never remain the same. Organisms therefore have to be flexibly attuned to the specific contingencies of any particular situation, something that no amount of preprogramming could ever achieve (see also Brooks, 1991; Reed, 1996; Shaw, 2003).

In several textbook accounts, this crucial point about the need for perceivers to be flexibly attuned to their specific situation is actually directed against Gibson, and deemed to place severe limits upon his own theoretical approach:

... Gibson's theory ... works best for innately programmed reactions to aspects of the natural environment, as when a bee finds its way back to the hive or a fish swims in water. ... The trouble with these kinds of interactions with the environment is that they are *stereotyped*. (Green, 1990, p. 518.)

[Gibson's approach] seems more suitable as an explanation of innately preprogrammed reactions to environmental circumstances. The visual array triggers stereotyped activity directly. A wasp buzzes against a closed window pane in reaction to a total visual environment. (Malim & Birch, 1998, p. 270-271; see also Taylor, 1999, p. 589-590.)

Bruce and Green's textbook on visual perception, first published in 1985, is the probable source of these later strikingly similar accounts. Yet Bruce and Green were *not* claiming that Gibson was a nativist, nor that his theory had no relevance to human perception. They were discussing his concept of affordances, and the role of conceptual knowledge in our understanding of things:

The Gibsonian concept of affordance ... is at its most powerful in the context of simple visually-guided behaviour such as that of insects. Here it does indeed make sense to speak of the animal detecting the information available in the



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light which is needed to organise its activities, and the notion of conceptual representation of the environment seems redundant.

For more intelligent creatures, and for people, we can make the same kind of argument about detection of distance, falling-off places and so on in the guidance of locomotion. (Bruce, & Green, 1985, p. 322; see also Bruce & Green, 1990, p. 390).

Overall, a sizeable minority of the textbooks (26%) continue to misrepresent him as an unqualified nativist, and sometimes in remarkably similar terms. This, however, is mainly a development since the 1990s. The earlier textbooks do correctly present his emphasis upon learning as the basis of perceptual differentiation.

THE 1979 GIBSON

In recent years, the textbooks have mainly taken Gibson's last book, *The ecological approach to visual perception*, as the definitive statement of his theoretical position (Gibson, 1979). Yet, the main features of his final theory were already in place. He had already rejected his early stimulus-response or "psychophysical" approach to perception, and developed most of the concepts presented in the 1979 book (e.g. Gibson, 1966), such as the senses as active perceptual systems, the optic array and optic flow, and visual proprioception. Gibson described his last book as a "sequel" (Gibson, 1979, p. 1) to his first book (Gibson, 1979), and, as such, it retains some of the same limitations: an exclusive emphasis on vision, and an awkward switching between discussions of surface perception and of the perception of 'meaning'. (In Gibson's first book, "direct perception", or what he then called "literal perception" was restricted to the perception of surface characteristics.)

Perhaps, the most distinctive aspect of Gibson's last book was the concept of "affordances" – the meanings of things for our actions.<sup>iii</sup> Gibson's account of affordances involves two claims. The first is that such meanings can be "directly perceived": that there is information available that specifies the affordances of things. Gibson regarded this first claim as the most important, even though it clearly presupposes a second, more fundamental, claim: that affordances *exist* in the world, although in relation to the animal in question:

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The *affordances* of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill. [...] I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment." (Gibson 1979, p. 127.)

The relational character of affordances is widely misunderstood as concerning the animal *as a perceiver*, whereas, for Gibson, the relation ultimately concerns the animal *as an agent*:

[Affordances] have unity relative to the *posture* and *behavior* of the animal being considered. So an affordance cannot be measured as we measure in physics. (Gibson 1979, pp. 127-128; emphasis added)

Putting meaning back into the world in this way was a fundamental move on Gibson's part, and challenged a long tradition within Western thought that has placed meaning exclusively within the realm of the mental, as a purely subjective quality.

Many of the recent textbooks make some reference to the concept of affordances, but seldom mention or explore its deeper theoretical implications. Most of them approvingly note that the concept reflects Gibson's "real-world" emphasis, and his insistence upon the biological significance of perception as a basis for our activity and survival in the world, even when they reject his basic theoretical approach (Styles, 2005, p. 67).

Many of the textbooks do discuss Gibson's claim that affordances can be directly perceived, but then conclude that this claim is restricted to relatively simple activities, and must be based on innate mechanisms, as in the various accounts about bees and birds that we have already cited. None of the introductory textbooks seriously explains or critically examines the wider philosophical implications of the concept of affordances as a challenge to dualistic thinking within psychological theory (see Costall, 1995; Heft, 2001).

## GIBSON AS A 'COMPLEMENTARY THEORIST'

This article has been concerned with how the textbooks deal with dissidence, and we chose James Gibson as our case study since he was not only a dissident, challenging the accepted foundations of psychological theory, but also remained widely respected within the

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discipline. For the best part of his long career, Gibson was trying to move beyond many of the dualisms that continue to structure modern thought: mind vs body; subject vs. object; person vs. world; and knower vs. known. His contributions were both critical and constructive. He presented a fundamental critique of traditional psychological theory, but also sought to develop a new theoretical approach that would overcome the standard dualisms. Gibson regarded his new approach as having wider implications for psychological theory: “The redefinition of perception implies a redefinition of the so-called higher mental processes” (Gibson, 1979, p. 255).<sup>iv</sup>

In an article on “Gibson’s revolution,” Neisser warned of the dangers of trying to assimilate dissidents within psychology to existing schemes, and he had neither Gibson as the target nor the textbook writers as the possible perpetrators solely in mind:

Perhaps more than scientists in other fields, psychologists believe that there is nothing new under the sun. ... Accustomed to this pattern, we try to understand each “new” proposal by mapping it on to some existing scheme. When an idea is really new, that strategy fails. (Neisser, 1990, p. 749)

As we have already seen, Gibson’s work has been assimilated to probabilistic, inference-based cue theory; stimulus-response and bottom-up theory; and the appeal to ‘hard-wiring’ and the innate pre-programming of development.<sup>v</sup> Ironically, despite his own warning about assimilation, Neisser’s influential *Cognition and reality* (1976) set the pattern for another version of the ‘Textbook Gibson’, where Gibson’s approach is presented as a complement to traditional theory, rather than a radical alternative.

Neisser (1976, p. xii) did admit that his proposed synthesis was a matter of some “dismay” to both James and Eleanor Gibson, but it has been enthusiastically taken up by the textbooks. According to this synthesis, Gibson’s direct perception is just a component of a more inclusive “perceptual cycle” that also involves a constructivist component. Benjafield’s textbook (1997, p. 31) explicitly refers to Neisser’s attempt at reconciliation: “Neisser integrated information processing psychology with Gibson’s theory of **direct visual perception**,” and even presents an account of Neisser’s synthesis before going into the details of Gibson’s own approach (see also Best, 1989, p. 108; Davenport 1996, p. 233).

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Later, Neisser (1992) came to talk of two distinct modes of perception, the Gibsonian and the constructivist, and the textbooks duly followed:

It is entirely possible, of course, that perceptual development involves both differentiation and enrichment. Which process is used presumably depends on the quality of stimulus information. Complex visual stimuli presented for a long period of time in bright light require perceptual differentiation for accurate perception, whereas visual stimuli presented very briefly in dim light need perceptual enrichment. (Eysenck, 1993, p. 25; see also, Gross & McIlveen, 1998, p. 188; Gross, 1996, p. 217.)

While direct perception may help us in understanding some of the early perception of sensory impressions, the constructive-perception theory is useful in understanding how sensory impressions are comprehended by the thinking brain. (Solso, 2001, p. 112.)

Most perception theorists (including Gregory, Marr, and Biederman) have focused on perception for recognition, whereas Gibson emphasised perception for action. (Eysenck & Keane, 2000, p. 62; see also Robinson-Riegler & Robinson-Riegler, 2004, pp. 93-94)

There is now a wide consensus that Gibson's approach complements traditional constructivist theory, and this is growing trend. As many as 35% of the textbooks we have examined present Gibson not as a dissident but as a complement to mainstream theory.

## ASSIMILATING DISSIDENCE

Attempts at theoretical synthesis are not in themselves, of course, unreasonable. But, in the case of dissident figures, such as Gibson, assimilation can be deeply misleading about the nature of a discipline if the textbooks fail to set out the reasons why the dissidents themselves were convinced (rightly or wrongly) that such reconciliation *could* not work.

And this brings us to what we regard as the most important problem with the 'Textbook Gibson.' Not all the textbooks we have consulted are misleading in the sense of including outright mistakes. Some of the accounts are careful and informative. But the introductory textbooks are *selective* in the following sense. Just a few of the textbooks do acknowledge that Gibson was "an influential and controversial theorist" (Sternberg, 2009, p. 101), and that he regarded the constructivist approach as "completely wrong headed" (Quinlan & Dyson, 2008, p. 215), but even these textbooks do not provide any serious explanation of the reasons for Gibson's challenge to mainstream psychology. The rest remain silent. In short, students reading these texts are spared the disturbing details about *why* one of psychology's most eminent figures had deep misgivings about the conceptual foundations of psychology as a science. The "Textbook Gibson" is, therefore, an important example of how disciplines can 'rehabilitate' their eminent dissidents by acknowledging their existence, assimilating their work to existing schemas, and ignoring their dissidence. This avoidance of controversy in the psychology textbooks would seem to go back a long way in psychology: "Textbooks are not, of course, the place to discuss such subjects" (de Laguna, 1918, p. 617).

William James was himself an early dissident, and also a crucial influence upon Gibson (see Heft, 2001). His student textbook, *The briefer course*, begins with the following reassurance, directed, no doubt, not so much at his student readers but at their instructors:

In preparing the following abridgement of my larger work, the Principles of Psychology, my chief aim has been to make it more directly available for classroom use. ... I have left out all the polemical and historical matter, all the metaphysical discussions and purely speculative passages, ... and (I trust) all the impertinences of the larger work. (James, 1892, p. iii)

By the end of his textbook, William James could, however, no longer contain himself:

When, then, we talk of 'psychology as a natural science,' we must not assume that that means a sort of psychology that stands at last on solid ground. It

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means just the reverse; it means a psychology particularly fragile, and into which the waters of metaphysical criticism leak at every joint, a psychology all of whose elementary assumptions and data must be reconsidered in wider connections and translated into other terms. ... This is no science, it is only the hope of a science. (James, 1892, p. 467-468).

## CONCLUSION

In this article, we have been concerned with the assimilation of dissidence by the textbook writers. We would like to end, therefore, with some advice to future dissidents. In the light of the early precedent set by William James and the fate of the "Textbook Gibson": (1) Write your *own* textbooks (if the publishers will let you!), and (2) subvert the downright carelessness and intellectual cowardice of this well-established scientific *genre*.

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<sup>i</sup> There is no consistent pattern across successive editions of the same textbook concerning whether James Gibson is included or not. The different editions of the Hilgard textbook shift from sometimes extensive treatments of Gibson to no mention at all. Eleanor Gibson, in contrast, is routinely cited in the textbooks, initially in relation to her work on perceptual learning, and later in relation to her research on the visual cliff (e.g. E. J. Gibson & Walk, 1960). Yet they seldom explain that James and Eleanor Gibson were married, and also involved in a joint project.

<sup>ii</sup> Bold font in the original. This font is widely used in the textbooks to indicate key terms.

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<sup>iii</sup> In fact, Gibson had already introduced the concept of affordances in this second book (Gibson, 1966, pp. 273-274), and it is also anticipated in a remarkable chapter on “meaning” in his first book (Gibson, 1950, e.g. p. 198).

<sup>iv</sup> Gibson also regarded his ecological approach as a conceptual contribution to the new environmental movement (Gibson, 1979, p. 2), but this concern has hardly been reflected in the subsequent research within ecological psychology.

<sup>v</sup> On the face of it, the persistence and level of such misrepresentations within the introductory textbooks is puzzling. The introductory textbooks are now a dominant and lucrative aspect of psychological publishing, and there is extensive vetting of such products by teams of referees prior to publication. Furthermore, the textbooks, once published, are then subject to book reviews. In many cases, the textbooks go on to appear in several editions and so are open to later correction, and yet these misrepresentations are still repeated (or else, as we have seen, become increasingly garbled). Finally, it is surely odd that those teaching psychology courses do not themselves take more care to check the quality of the relatively expensive texts they are recommending to their students.